

REMARKS

Entry of this Amendment is proper under 37 C.F.R. § 1.114. Applicants have submitted the Amendment and Reply filed on November 3, 2009 anew, but now including a request for an Examiner's Interview.

Entry of the Amendment, reexamination, and further and favorable reconsideration of the subject application in light of the following remarks, pursuant to and consistent with 37 C.F.R. §§ 1.114 and 1.111, are thus respectfully requested.

1. Request for Examiner Interview

Applicants submit Form PTOL413A requesting a formal, in-person interview with the Examiner and the undersigned attorney to discuss the claim amendments in order to expedite prosecution. There has been no interview to date in this application. Applicants request that the Examiner contact the undersigned attorney to schedule a telephone conference in advance of picking up this application.

2. Status of the Claims

Claims 1-8, 21-32, 39 and 40 stand pending. Claims 9-20, 22, and 31-38 stand previously canceled. Claims 1-8, 21-32, 39 and 40 stand rejected.

Upon entry of the present amendments, claims 1-3, 8, 21, and 39-40 stand amended to more precisely recite the claimed subject matter. Claims 7 and 32 stands canceled. Claims 41-49 are newly introduced. Support for the amendments, as well as the newly added claims, can be found at least from the originally presented claims and Specification, for example, as follows:

Claim	Exemplary Support
1	original claim 7; p. 17, lines 2-4 and 23-24
2	original claim 7
3	original claim 7
8	original claim 7
21	original claim 32; p. 17, lines 2-4 and 23-24
39	p. 11, lines 25-29; p. 17, lines 2-4 and 23-24; p. 20, lines 21-25; p. 25, lines 1-4; and p. 43, lines 19-23

Claim	Exemplary Support
40	original claim 7
41	p. 15, lines 22-26
42	p. 15, lines 22-26
43	p. 11, lines 25-29; p. 32-42; and p. 43, lines 19-23
44	p. 32, lines 2-24; para. bridging p. 33-34; and para. bridging pages 35-36
45	p. 15, lines 22-26
46	p. 15, lines 22-26
47	p. 11, lines 25-29; p. 32-42; and p. 43, lines 19-23
48	p. 32, lines 2-24; para. bridging p. 33-34; and para. bridging pages 35-36
49	p. 20, lines 21-25

Accordingly, Applicants do not believe that the amendments add prohibited subject matter that is unsupported in the Specification as filed.

The claims have been amended without prejudice to, or disclaimer of, the canceled subject matter. Applicants reserve the right to file a continuation or divisional application on any subject matter canceled by way of amendments.

3. Certified Priority Documents

Applicants appreciate the Office's acknowledgement that the certified priority documents have been received in the instant application.

4. Acceptance of Drawing

Applicants appreciate the Office's acknowledgement that the drawings filed April 8, 2005, are accepted.

5. Acknowledgement of Information Disclosure Statements

Applicants appreciate the Office's acknowledgement of the Information Disclosure Statements (IDS's) filed August 6, 2009; June 1, 2009; and April 22, 2009.

Applicants herewith submit two PTO-1449 forms to correct typographical errors contained in previously submitted and acknowledged IDS's. For the IDS submitted February 16, 2006, the "US 6,221,320" corresponding to JP 11-292799 (the last reference in Foreign Patent Documents) should have been listed as "US 6,331,320." For the IDS submitted April 8, 2005, the "JP 09-242825" (the third reference in Foreign Patent Documents) should have been listed as "JP 08-242825." The Office is respectfully requested to enter the corrections, so that the references are accurately cited on the face of any issuing patent. No fee is believed to be necessary for this submission.

6. Rejection of the Claims Under 35 U.S.C. § 102(b)

The Office maintains the rejection of claims 1-2, 4-8, 21, 23-25, 29, 32, and 39 under 35 U.S.C. § 102(b) for the same reasons as stated in the Office Action mailed January 27, 2009. The claims are allegedly anticipated by **Nakahara** et al., WO 99/52841 ("Nakahara"). The Office actually relies on U.S. Patent No. 6,331,320 ("the '320 patent") as the translation of Nakahara.

In the Amendment / Response filed April 22, 2009, Applicants have (1) amended claims to recite "a gas having a temperature of 140 to 500°C and a pressure of 0.1 to 100 MPa," and (2) argued that Nakahara fails to disclose at least the recited gas. The Office, however, discounts the arguments, asserting that Nakahara disclose a method using a "high-temperature and high-pressure gas / fluid (supercritical gas / fluid)." Office Action, page 3. Relying on Nakahara's teaching of the critical point of water, *i.e.*, 374°C and 22.1 MPa, the Office asserts that Nakahara discloses *a supercritical gas / fluid* as presently claimed. *Id.*, at 4.

Applicants traverse the rejection to the extent it may be applied to the amended claims for the following reasons.

6.1. Rejection of Claims 1, 4-5, 32, and 39

The Office rejects claims 1, 4-5, 32, and 39 as allegedly anticipated under § 102(b), asserting, "Nakahara et al disclose[s] anaerobic state meaning absence of oxygen, therefore

Nakahara et al meets the oxygen concentration limitation.” Office Action mailed January 27, 2009, page 3.

Applicants traverse. For prior art to anticipate a claim, it must disclose each and every element of the claim explicitly or inherently. *See In re Rijckaert*, 9 F.3d 1531, 1534, 28 U.S.P.Q.2d 1955, 1957 (Fed. Cir. 1993).

Amended independent claims 1, 21, 39, and their dependent claims, recite a method of processing a plant or a processed material with **a gas having a temperature of 140 to 250°C and a pressure of 0.25 to 4.5 MPa**. Nakahara, at best, discloses a method of extracting aromatic compounds by treating plant materials with the *supercritical or subcritical water*:

Treatment is preformed under conditions under which is in a supercritical state at a temperature of about 374°C. (pressure at this time is about 221 atmospheres or more) to about 500°C. (about 300 atmospheres or more), or under conditions under which water is in a subcritical state at a temperature exceeding about 300°C. (exceeding about 150 to 200 atmospheres).¹

See the ‘320 patent, col. 4, lines 15-21. First, the supercritical or subcritical water is **not** a gas. Furthermore, both the temperature and pressure disclosed in Nakahara are outside the claimed ranges. Nakahara fails to disclose at least these claim elements, because the claimed gas distinguishes from the disclosed supercritical or subcritical water. Accordingly, claims 1, 4-5, and 39 are novel over Nakahara. Claim 32 stands canceled, mooted the rejection. Applicants respectfully request withdrawal of the rejection, and allowance of claims 1, 4-5, and 39.

6.2. Rejection of Claims 2 and 23

The Office rejects claims 2 and 23 as anticipated under § 102(b), because Nakahara allegedly discloses a treatment time that is within about 30 minutes or within about 2 minutes respectively (col. 4, lines 22-23). The Office asserts that the disclosed time periods, temperature, and pressure ranges in Nakahara overlap with the recited ranges in the present application. Office Action mailed January 27, 2009, page 3.

Applicants traverse. As discussed in section 6.1 *supra*, Nakahara fails to disclose at least **a gas having a temperature of 140 to 250°C and a pressure of 0.25 to 4.5 MPa**, which is recited

in both claims 2 and 23. Additionally, claim 23 recites that the claimed method results in an increased amount of vanillin. At best, Nakahara may enable the extraction of *pre-existing* aromatic compounds. The Office is directed to Nakahara, col. 2, lines 32-43:

The present invention is a process for producing aromatic compounds derived from a plant, or polymers of the aromatic compounds, in a short period of time and by a simple procedure, the process comprising treating a plant material with supercritical water or subcritical water to *liberate* aromatic compounds, which are contained in the plant material, and/or aromatic compounds, which have been generated upon decomposition of components of the plant material, as individual compounds or polymers thereof to the outside of the plant material; and separating and purifying the liberated aromatic compounds or their polymers.

(emphasis added); *see also* Abstract (“...to liberate aromatic compounds,...”). Nakahara’s method, however, does not lead to the decomposition of lignin in the plant material and the release of new and/or additional aromatic compounds. Nakahara thus fails to disclose, either explicitly or inherently, that an *increased* amount of vanillin would have or could have been produced. As the reference does not teach every recited claim element, it cannot anticipate the claims. Accordingly, Applicants respectfully request withdrawal of the rejection, and allowance of claims 2 and 23.

6.3. Rejection of Claim 6

The Office rejects claim 6 as anticipated under § 102(b), because Nakahara allegedly discloses that the anaerobic state may be achieved by evacuating or fully purging the inside of the container with an inert gas before processing (col. 4, line 14). Office Action mailed January 27, 2009, page 3.

Applicants traverse. As discussed in section 6.1 *supra*, Nakahara fails to disclose at least *a gas having a temperature of 140 to 250°C and a pressure of 0.25 to 4.5 MPa*, which is recited in claim 6. As the reference does not teach every element of claim 6, it cannot anticipate the claim. Accordingly, Applicants respectfully request withdrawal of the anticipation rejection, and allowance of claim 6.

¹ Upon conversion, the disclosed supercritical water has a temperature of about 374-500°C and a pressure of about 22.4-30.4 MPa, while the disclosed subcritical water has a temperature exceeding about 300°C and a pressure

6.4. Rejection of Claims 7 and 21

The Office rejects claims 7 and 21 as anticipated under § 102(b), because Nakahara allegedly discloses that the recovered aqueous solution may contain lignin (col. 4, lines 61-62). The Office apparently implies that the lignin must have come from the plant material that has been processed. In addition, Nakahara allegedly teaches that vanillin may be obtained by the described process (col. 2, line 49). Office Action mailed January 27, 2009, pages 3-4.

Applicants traverse. As discussed in section 6.1 *supra*, Nakahara fails to disclose at least ***a gas having a temperature of 140 to 250°C and a pressure of 0.25 to 4.5 MPa***, which is recited in claim 21. Additionally, claim 21 recites that the claimed method results in an ***increased*** vanillin amount. At best, Nakahara's process may enable the extraction of pre-existing aromatic compound. However, Nakahara's process does not lead to the decomposition of lignin in the plant material and the release of new and/or additional aromatic compounds. *See* section 6.2 *supra*.

Nakahara thus fails to disclose, either explicitly or inherently, that an increased amount of vanillin would have been produced. As the reference does not teach every recited claim element, it cannot anticipate the claims. Claim 21 is novel over Nakahara. Claim 7 stands canceled, thereby mooting the rejection. Accordingly, Applicants respectfully request withdrawal of the anticipation rejection, and allowance of claim 21.

6.5. Rejection of Claim 8

The Office refers to "col. 8, lines 58-67" when rejecting claim 8. Office Action mailed January 27, 2009, page 4. For record clarity, Applicants submit that the Office must have meant "col. 2, lines 58-67," because "col. 8, lines 58-67" does not exist.

The Office rejects claim 8 as anticipated under § 102(b), because Nakahara allegedly discloses processing plants such as cherry tree, pine tree, Japanese chestnut tree, maple tree, zelkova tree, and camphor tree (col. 2, lines 58-67). The Office apparently implies that some or all of the above plants contain lignin.

exceeding about 15.2 to 20.3 MPa.

Applicants traverse. As discussed in section 6.1 *supra*, Nakahara fails to disclose at least ***a gas having a temperature of 140 to 250°C and a pressure of 0.25 to 4.5 MPa***, which is recited in claim 8. As the reference does not teach every recited claim element, it cannot anticipate the claim. Accordingly, Applicants respectfully request withdrawal of the anticipation rejection, and allowance of claim 8.

6.6. Rejection of Claims 24-25

The Office rejects claims 24-25 as anticipated under § 102(b), because Nakahara allegedly discloses that vanillin-containing compositions may be used as a raw material for food, drink, or liqueur (col. 1, lines 33-35). Office Action, page 4.

Applicants traverse. As discussed in section 6.1 *supra*, Nakahara fails to disclose at least ***a gas having a temperature of 140 to 250°C and a pressure of 0.25 to 4.5 MPa***, which is recited in both claims 24-25. Additionally, both claims 24-25 recite that the claimed method results in an ***increased*** amount of vanillin. At best, Nakahara's process may enable the extraction of pre-existing aromatic compound. However, Nakahara's process does not lead to the decomposition of lignin in the plant material and the release of new and/or additional aromatic compounds. See section 6.2 *supra*. Nakahara thus fails to disclose, either explicitly or inherently, that an increased amount of vanillin would have or could have been produced. As the reference does not teach every recited claim element, it cannot serve to anticipate the claims. Accordingly, claims 24-25 are novel over Nakahara. Applicants respectfully request withdrawal of the anticipation rejection, and allowance of claims 24-25.

6.7. Rejection of Claim 29

The Office rejects claim 29 as anticipated under § 102(b), because Nakahara allegedly discloses exposing the product to a low pressure by cooling the reactor and opening the reactor after the treatment (col. 4, lines 34-38). Office Action mailed January 27, 2009, page 4.

Applicants traverse. As discussed in section 6.1 *supra*, Nakahara fails to disclose at least ***a gas having a temperature of 140 to 250°C and a pressure of 0.25 to 4.5 MPa***, which is recited in claim 29. Additionally, claim 29 recites that the claimed method results in an ***increased***

amount of vanillin. At best, Nakahara's process may enable the extraction of pre-existing aromatic compound. However, Nakahara's process does not lead to the decomposition of lignin in the plant material and the release of new and/or additional aromatic compounds. *See* section 6.2 *supra*. Nakahara thus fails to disclose, either explicitly or inherently, that an increased amount of vanillin would have or could have been produced. As the reference does not teach every recited claim element, it cannot anticipate the claim. Accordingly, Applicants respectfully request withdrawal of the anticipation rejection, and allowance of claim 29.

6.8. Newly Introduced Claims 41-49

Each of the newly introduced claims 41-49 recites ***a gas having a temperature of 140 to 250°C and a pressure of 0.25 to 4.5 MPa***, because they depend from claims 1, 21, or 39. As discussed in section 6.1 *supra*, Nakahara fails to disclose at least these elements. Accordingly, new claims 41-49 stand novel over Nakahara.

7. Rejection of the Claims Under 35 U.S.C. § 103(a)

Applicants traverse the obviousness rejection over Nakahara and / or Ono for at least the following reasons. Nakahara and Ono are both directed to solving different problems using different solutions and methods. Specifically, Nakahara is directed to solving the problem of extracting naturally occurring aromatic substances from a plant material. It does not address the problem presently addressed in the instant application of increasing the amount of a compound above that which is naturally occurring, *i.e.* vanillin, by chemical processing. Ono is directed to solving the problem of removing lipids from a malt using a different solution and different methods. Vanillin is not a lipid. Additionally, Ono is not directed to increasing the amount of a compound above that which is naturally occurring, *i.e.* vanillin, by chemical processing. The Office provides no guidance as to why someone skilled in the art at the time could have possibly been motivated to use such different methods, solving such different problems, to increase the amount of vanillin obtainable from a plant source.

Therefore, the Office's use of either reference alone or in combination fails to teach the process of the present claims, which addresses a different problems, uses different materials, and a different process from Ono and Nakahara. Accordingly, for the above reasons and those detailed more specifically below, these references cannot render the pending claims obvious.

7.1. Rejection relying on Nakahara

The Office maintains the rejection of claims 3, 28, and 30-31 under 35 U.S.C. § 103(a) for the same reasons as stated in the Office Action mailed January 7, 2009. Claims are allegedly obvious over Nakahara. The Office rejects claim 40 for the same reason as the rejection of claim 3. Office Action, page 4.

In the Amendment / Response filed April 22, 2009, Applicants argued that Nakahara fails to teach or suggest the recited "gas." The Office does not specify the reasons for maintaining the rejection other than the assertion that Nakahara discloses a method using a "high-temperature and high-pressure gas / fluid (supercritical gas / fluid)." *See supra*; Office Action, page 4.

As discussed in section 6 *supra*, Nakahara fails to teach at least **a gas having a temperature of 140 to 250°C and a pressure of 0.25 to 4.5 MPa**, which is recited in each claim.

Nakahara at best may teach subcritical or supercritical water, which is *not* a gas. Furthermore, both the temperature and pressure ranges taught in Nakahara are outside the claimed ranges. Nakahara thus fails to teach at least the very limitation it is asserted for. Additionally, Applicants traverse the obviousness rejection to the extent it may be applied to the amended claims for the following additional reasons.

7.1.1. Rejection of Claim 3

The Office rejects claim 3 as obvious under § 103(a). The Office admits that Nakahara does not disclose the temperature range as recited in claim 3 (160-250°C). Office Action mailed January 27, 2009, page 5. The Office asserts that a skilled artisan would have been motivated to modify the temperature based on the solvent, pressure, and other conditions. *Id.*

Applicants traverse. A finding of obviousness under 35 U.S.C. § 103 requires a determination of the scope and content of the prior art, the differences between the invention and the prior art, the level of ordinary skill in the art, and whether the differences are such that the claimed subject matter as a whole would have been obvious to one of ordinary skill in the art at the time the invention was made. *Graham v. John Deere Co.*, 383 U.S. 1, 148 U.S.P.Q. 459 (1966); *KSR Int'l Co. v. Teleflex Inc.*, 82 U.S.P.Q.2d 1385 (2007). Both the suggestion of the claimed invention and the expectation of success must be in the prior art, not from the disclosure of the claimed invention. *In re Dow Chem. Co.*, 837 F.2d 469, 5 U.S.P.Q.2d 1529 (Fed. Cir. 1988). Additionally, "obviousness requires a suggestion of *all* limitations in a claim." *CFMT, Inc. v. Yieldup Int'l Corp.*, 349 F.3d 1333, 1342, 68 U.S.P.Q.2d 1940, 1947 (Fed. Cir. 2003) (citing *In re Royka*, 490 F.2d 981, 985, 180 U.S.P.Q. 580, 583 (C.C.P.A. 1974) (emphasis added)). Furthermore, one ordinarily skilled in the art would have had a reasonable expectation of success to practice the claimed invention. *Examination Guidelines for Determining Obviousness under 35 U.S.C. 103 in View of the Supreme Court Decision in KSR International Co. v. Teleflex Inc.*, 72 Fed. Reg. 57,528.

Claim 3 recites extracting with a *gas* at **160-250°C** and **0.5-4.5 MPa**. Nakahara teaches employing supercritical water (above 374°C and above 22.4 MPa) or subcritical water (above 300°C and above 15.2 MPa). *See* the '320 patent, col. 4, lines 15-21. As discussed in section 6

supra, the supercritical or subcritical water of Nakahara is not a gas. The temperature taught in Nakahara is outside the claimed range, 160 to 250°C. Likewise, the pressure taught in Nakahara is outside the claimed range, 0.5-4.5 MPa. As Nakahara fails to suggest at least above elements of claim 3, it cannot render claim 3 obvious. There can be no reasonable expectation of success to practice the claimed method absent these teachings.

Furthermore, the presently claimed methods offer unexpected advantages over the method taught in Nakahara. As discussed in section 6.2 *supra*, Nakahara's method merely enables the extraction of *pre-existing* aromatic compounds, because Nakahara's method does not lead to the decomposition of lignin in the plant material and the release of new and/or additional aromatic compounds. The present claimed methods, however, differ from Nakahara's method, because these methods produce *new* flavors by decomposing lignin in the plant. *See* Specification, paragraph bridging pages 4-5.² Such an advantage is an unexpected in view of Nakahara, which merely teaches extracting *pre-existing* compounds without providing any new flavor or aroma.

Amended claim 3 is thus nonobvious over Nakahara. Accordingly, Applicants respectfully request withdrawal of the obviousness rejection, and allowance of claim 3.

7.1.2. Rejection of Claim 28

The Office rejects claim 28 as allegedly obvious under § 103(a). The Office admits that Nakahara does not disclose the quantification/characteristic of the vanillin obtained. Office Action mailed January 27, 2009, page 5. The Office appears to make the rejection based on inherency. The Office alleges that a skilled artisan would have recognized such

² "In order to achieve the above objects, the present inventors have intensively studied. As a result, they have found that by processing a plant with high-temperature and high-pressure liquid or gas under low-oxygen conditions, it is possible to *decompose* lignin in the plant and increase low-molecular phenol compounds (constituents of lignin) such as vanillin, p-coumaric acid (para-coumaric acid), or ferulic acid, thereby enabling the plant to have *a new flavor*. In addition, they have also found that the Maillard reaction occurs among components contained in the plant and organic acids are increased due to such processing. The products of the Maillard reaction and organic acids produced through the processing described above and the changes of other components in the plant due to the processing described above make it possible to provide a plant finished product having *a new aroma, taste, and color*, and food or drink manufactured using such plant finished product as a raw material." (emphasis added).

quantification/characteristic, because Nakahara and the present claims employ the same methods on the same starting materials. *Id.*

Applicants traverse. First, claim 28 recites a method using a gas having a temperature of 140 to 250°C and a pressure of 0.25 to 4.5 MPa. As discussed in section 6 *supra*, the supercritical or subcritical water of Nakahara is not a gas. Additionally, both the temperature and the pressure taught in Nakahara are also outside the claimed ranges. Second, claim 28 recites the production of an *increased* amount of vanillin. Nakahara's method can only extract the *pre-existing* vanillin in the plant material. See Nakahara, col. 2, lines 32-43; Abstract. Nakahara's method, however, does not lead to the decomposition of lignin in the plant material and the release of new and/or additional aromatic compounds. See sections 6.2 and 7.1.1 *supra*.

Third, if an explicit suggestion or teaching is missing from a reference, it cannot be supplied by an inherent feature to support an obviousness rejection. *In re Sernaker*, 702 F.2d 989, 217 U.S.P.Q. 1 (Fed. Cir. 1983). In the present application, the Office cannot rely upon inherency to adduce a *prima facie* obviousness rejection. As Nakahara fails to teach or suggest at least the above claim elements of claim 28, the reference also fails to provide a reasonable expectation of success to practice the claimed method.

Claim 28 is thus nonobvious over Nakahara. Accordingly, Applicants respectfully request withdrawal of the rejection and allowance of claim 28.

7.1.3. Rejection of Claims 30-31

The Office rejects claims 30-31 as purportedly obviousness under § 103(a). The Office asserts that "vanillin production using extruders in order to produce particular shape of the vanillin product was well known in the art." Office Action mailed January 27, 2009, page 6. The Office apparently admits that Nakahara does not teach employing an extruder and a particular shape of the vanillin product. Nevertheless, the Office concludes that one skilled artisan would have been motivated to use an extruder to produce a shaped vanillin product.

Applicants traverse. Claim 30-31 recite a method using a gas having a temperature of 140 to 250°C and a pressure of 0.25 to 4.5 MPa. As discussed in section 6 *supra*, the supercritical or subcritical water of Nakahara is not a gas. Additionally, both the temperature

and the pressure taught in Nakahara are outside the claimed ranges. Additionally, claims 30-31 recite the production of an *increased* amount of vanillin. Nakahara's method can only extract the pre-existing vanillin in the plant material. *See* sections 6.2 and 7.1.1 *supra*; *see also* Nakahara, col. 2, lines 32-43; Abstract. Nakahara's method cannot generate an increased amount of vanillin from decomposing lignin, because this reaction fails to occur in Nakahara's process. As Nakahara fails to teach or suggest at least the above claim elements, the reference also fails to provide a reasonable expectation of success to practice the claimed methods.

Claims 30-31 are thus nonobvious over the cited art. Accordingly, Applicants respectfully request withdrawal of the rejection and allowance of claims 30-31.

7.1.4. Claim 40

The Office rejects claim 40 for the same reason as the rejection of claim 3. Office Action, page 4.

Applicants traverse. Claim 40 recites extracting with a *gas* of *160-250°C* and *0.5-4.5 MPa*. Nakahara discloses employing supercritical water (above 374°C and above 22.4 MPa) or subcritical water (above 300°C and above 15.2 MPa). *See* the '320 patent, col. 4, lines 15-21. As discussed in section 6 *supra*, the supercritical or subcritical water of Nakahara is not a gas. Additionally, both the temperature and pressure taught in Nakahara are outside the claimed ranges. As Nakahara fails to suggest at least the above elements of claim 40, it cannot render claim 40 obvious. There can be no reasonable expectation of success to practice the claimed method absent these teachings. Furthermore, the presently claimed methods offer unexpected advantages over the method taught in Nakahara by at least producing an increased amount of vanillin. *See* section 7.1.1 *supra*. Such an advantage amounts to an unexpected result.

The method recited in claim 40 is thus nonobvious over Nakahara. Accordingly, Applicants respectfully request withdrawal of the obviousness rejection and allowance of claim 40.

7.1.5 Newly Introduced Claims 41-49

Each of the newly introduced claims 41-49 recites ***a gas having a temperature of 140 to 250°C and a pressure of 0.25 to 4.5 MPa.*** As discussed in section 6 *supra*, the supercritical or subcritical water of Nakahara is not a gas. Additionally, both the temperature and pressure taught in Nakahara are outside the claimed ranges. As Nakahara fails to suggest all claim elements, the reference also fails to provide a reasonable expectation of success to practice the claimed methods. Accordingly, newly introduced claims 41-49 are nonobvious over Nakahara.

7.2. Rejection Relying on Nakahara and Ono

7.2.1. Claims 26-27

The Office maintains the rejection of claims 26-27 under 35 U.S.C. § 103(a) for the same reasons as stated in the Office Action mailed January 7, 2009. Claims are allegedly obvious over Nakahara further in view of **Ono** et al., U.S. Patent No. 5,460,836 ("Ono").

Applicants traverse. The Office admits that Nakahara does not teach processing a malt. Office Action mailed January 27, 2009, page 6. Additionally, Nakahara fails to teach processing grain as the lignin-containing material. Ono allegedly teaches (1) processing a malt to obtain a lipid through supercritical or subcritical carbon dioxide, and (2) brewing beer with superior properties from the processed malt. The Office asserts that the advantages of Ono's process would have motivated a skilled artisan to combine Nakahara's process with Ono's, *i.e.*, by modifying Nakahara's method to employ a malt as a raw material. *Id.*

As discussed above, Nakahara and Ono address different problems, using different solutions to obtain different ends than what Applicants presently claimed. First, Nakahara and Ono fail to teach all the limitations of the present claims:

- Nakahara and Ono fail to teach or suggest the recited "gas;"
- The references do not teach a gas having ***a temperature of 140 to 250°C;***
- The references do not teach a gas having ***a pressure of 0.25 to 4.5 MPa;*** and
- The references do not teach a means of increasing the amount of a substance, *i.e.* vanillin, above that which is naturally occurring.

Thus the references alone, or when combined, fail to teach all the claim limitations of claims 26-27.

While Nakahara teaches aromatic compound extraction, it only teaches extraction of the naturally existing compounds. Nakahara fails to provide any information on how to increase the amount of a specific aromatic in a plant and extract that enhanced amount. *See* sections 6.2 and 6.1.1 *supra*; *see also* Nakahara, col. 2, lines 32-43; Abstract. Notably Nakahara's method does not involve the decomposition of lignin in the plant source. Therefore, Nakahara cannot increase the amount of vanillin present, as it fails to utilize this process. Ono likewise fails to teach anything regarding the decomposition of lignin or any other compound as a means of enhancing the amount of vanillin present.

Ono teaches removing lipids from a malt using subcritical or supercritical carbon dioxide. Vanillin is not a lipid. Ono does not teach or suggest employing the claimed gas, or the temperature or pressure limitations.³ Ono does not teach extraction of low molecular weight phenol compounds whatsoever, such as vanillin. Nor does Ono suggest that such compounds could even be extracted from a malt. Finally, Ono also fails to teach anything about how to increase the amount of a compound by decomposing another compound present in the malt. Thus, Ono's process could not have taught a means of how to produce more vanillin than that which is naturally occurring. Neither Ono nor Nakahara provide a solution to the problem of how to increase the amount of a compound beyond that which is naturally present in the source material.

Nakahara's process differs from that of Ono as to the design and purpose. Ono teaches *removing lipids*. Nakahara's method, however, aims to *extract aromatic compounds or polymers* from a plant material. Thus, the extracted compounds are different. Ono and Nakahara also use different steps. For example, Ono's process is carried out at a *mild* temperature (25-65°C) to *preserve enzyme activity* in the malt. *See* Ono, col. 3, lines 55-58.⁴ The temperature range taught in Nakahara (above 300°C), if employed in the Ono's process,

³ Upon conversion, the subcritical or supercritical carbon dioxide of Ono has a temperature range of 25-65°C and a pressure range of 5.9-39.2 MPa. *See* Ono, claim 1. The claimed gas is at a temperature of 140 to 250°C and a pressure of 0.25 to 4.5 MPa.

⁴ "In the present invention, the lipid extraction and removal treatment is carried out under *mild temperature* and pressure conditions which *do not damage the enzyme activity of the malt*." (emphasis added).

would have inactivated enzyme activities in the malt, defeating Ono's objective. The Office provided no guidance as to which of the many different steps and details were to be selected from the other steps and details taught, and *why* an artisan would have been so motivated to combine these two references, teaching solutions to different problems using different means.

The references fail to teach all the limitations. The references fail to provide any motivation to combine the references. Thus, the references cannot have provided any expectation of success that the present claims could have worked. Thus, claims 26-27 stand nonobvious over Nakahara and Ono. Accordingly, Applicants respectfully request withdrawal of the rejection, and allowance of claims 26-27.

7.2.2. Newly Introduced Claims 41-49

Each of the newly introduced claims 41-49 recites ***a gas having a temperature of 140 to 250°C and a pressure of 0.25 to 4.5 MPa.*** As discussed in section 6 *supra*, the supercritical or subcritical water of Nakahara is not a gas. Additionally, both the temperature and pressure taught in Nakahara are outside the claimed ranges. Similarly, Ono does not teach or suggest employing the claimed gas, because Ono's process employs the subcritical or supercritical carbon dioxide at a temperature and a pressure outside the claimed ranges. At best, Ono may teach extracting and removing lipids from malt using subcritical or supercritical carbon dioxide. As discussed in section 7.2.1 *supra*, a skilled artisan would have had no reasonable motivation to combine Nakahara and Ono to extract aromatic compounds. Even if the references are combined, Ono fails to cure the defects of Nakahara to teach or suggest all claim elements.

As the references, alone or viewed in combination, fail to teach all claim elements, newly introduced claims 41-49 are nonobvious.

CONCLUSION

Should the Examiner have any questions or comments regarding Applicants' amendments or response, please contact Applicants' undersigned representative at (202) 842-8821. Furthermore, please direct all correspondence to the below-listed address.

In the event that the Office believes that there are fees outstanding in the above-referenced matter and for purposes of maintaining pendency of the application, or for Notice of Appeal, the Office is authorized to charge the outstanding fees to Deposit Account No. 50-0573. The Office is likewise authorized to credit any overpayment to the same Deposit Account Number.

Respectfully Submitted,

Date: December 4, 2009

By: 

Mercedes K. Meyer, Ph.D., Esq.
Registration No. 44,939

DRINKER BIDDLE & REATH LLP
Customer No. **55694**
1500 K Street, N.W., Suite 1100
Washington, D.C. 20005-1209
Tel. No.: (202) 842-8800
Fax No.: (202) 842-8465